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Jurgen Weichart

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CLEVELAND, OH 44114-3108

EXAMINER

EGGERDING, MATTHEW THOMAS

ART UNIT

PAPER NUMBER

1763

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

|                              |                                      |   |  |
|------------------------------|--------------------------------------|---|--|
| <b>Office Action Summary</b> | <b>Application No.</b><br>10/542,075 | <b>Applicant(s)</b><br>WEICHART, JURGEN |  |
|                              | <b>Examiner</b><br>Matthew Eggerding | <b>Art Unit</b><br>1763                 |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 13 July 2005 (Prelim Amend).
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-23 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☒ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>20050713</u> . | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1, 4, 6-8, 11, 13, 15, 19 and 23 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The term "large" in claim 1 is a relative term which renders the claim indefinite. The term "large" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. "Large" can be interpreted as the total area of the substrate secured to the carrier or the proportion of the substrate area secured to the carrier. For the sake of examination, this claim is interpreted to mean the proportion of the area of the substrate.

A broad range or limitation together with a narrow range or limitation that falls within the broad range or limitation (in the same claim) is considered indefinite, since the resulting claim does not clearly set forth the metes and bounds of the patent protection desired. See MPEP § 2173.05(c). Note the explanation given by the Board of Patent Appeals and Interferences in *Ex parte Wu*, 10 USPQ2d 2031, 2033 (Bd. Pat. App. & Inter. 1989), as to where broad language is followed by "such as" and then narrow language. The Board stated that this can render a claim indefinite by raising a question or doubt as to whether the feature introduced by such language is (a) merely

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exemplary of the remainder of the claim, and therefore not required, or (b) a required feature of the claims. Note also, for example, the decisions of *Ex parte Steigewald*, 131 USPQ 74 (Bd. App. 1961); *Ex parte Hall*, 83 USPQ 38 (Bd. App. 1948); and *Ex parte Hasche*, 86 USPQ 481 (Bd. App. 1949). In the present instance, claim 1 recites the broad recitation "an installation," and the claim also recites "in particular a vacuum installation" which is the narrower statement of the range/limitation. In addition, claim 1 recites the broad recitation "for processing a substrate," and the claim also recites "in particular a semiconductor wafer" which is the narrower statement of the range/limitation. Claim 4 recites the broad recitation "a vacuum-compatible, thermally stable film," and the claim also recites "in particular of polyimide" which is the narrower statement of the range/limitation. Claim 6 recites the broad recitation "the chuck electrode being electrically insulated from the radiofrequency electrode," and the claim also recites "in particular an insulated leadthrough" which is the narrower statement of the range/limitation. Claim 7 recites the broad recitation "the chuck electrode comprises a dielectric," and the claim also recites "in particular a plate of aluminum oxide" which is the narrower statement of the range/limitation. Claim 8 recites the broad recitation "a voltage source for applying a voltage between the frame and the chuck electrode," and the claim also recites "in particular to generate a DC voltage of 200-1500 V, preferably 500-1000 V" which is the narrower statement of the range/limitation. Claim 11 recites the broad recitation "a carrier," and the claim also recites "in particular a film" which is the narrower statement of the range/limitation. Claim 13 recites the broad recitation "a non-conductive dielectric material," and the claim also recites "in particular from polyimide"

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which is the narrower statement of the range/limitation. Claim 15 recites the broad recitation "processing a substrate," and the claim also recites "in particular a semiconductor wafer" which is the narrower statement of the range/limitation. Claim 19 recites the broad recitation "the voltage being applied between the chuck electrode and the frame," and the claim also recites "in particular by means of an insulated leadthrough" which is the narrower statement of the range/limitation. These claims will be examined on the basis of the narrower statement of the range/limitation

Claim 23 provides for releasing the substrate by short-circuiting the carrier with the chuck electrode. This claim is vague and indefinite because it is unclear as to whether the substrate is released from the carrier or the substrate/frame/carrier complex is released from the chuck. For the sake of examination this claim will be interpreted as releasing the substrate, along with the frame and carrier, from the chuck.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.

4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

- A. Claims 1, 11, 15 and 16

Claims 1, 11, 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent No. 6,547,559 to Hodos ("Hodos") in view of US Application No. 2003/0012628 A1 to Nigg et al. ("Nigg").

Hodos teaches a vacuum process installation for processing a semiconductor wafer, having at least one processing station, characterized in that to hold and/or transport the substrate, the installation comprises at least one frame capable of clamping. (Fig. 3; col. 4, lines 52-60)

Hodos does not teach a clamped-in carrier or the possibility for the substrate to be secured to the carrier over a large area.

Nigg teaches a film carrier that is attached to a frame and capable of securing the substrate over a large area. (Fig. 1, 2; para. [0005]).

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to utilize a carrier with the teachings of Hodos.

The suggestion/motivation would have been to protect the wafer during processing by providing a film carrier in conjunction with a frame. (Nigg, para. [0005]).

For claim 15, Hodos teaches a method for processing a substrate, in particular a semiconductor wafer, in a vacuum process installation, characterized in that the substrate, in order to be held and/or transported, is secured clamped in a frame. (Fig. 3; col. 4, lines 52-60).

Hodos does not teach the substrate secured over a large area to a carrier in a frame.

Nigg teaches a film carrier that is attached to a frame and capable of securing the substrate over a large area. (Fig. 1, 2; para. [0005]).

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to utilize a carrier with the teachings of Hodos.

The suggestion/motivation would have been to protect the wafer during processing by providing a film carrier in conjunction with a frame. (Nigg, para. [0005]).

For claim 16, Nigg teaches the substrate is adhesively bonded to a first planar main surface of the carrier by means of a vacuum-compatible and releasable adhesive. (para. [0023]).

B. Claim 2, 6, 7, 14, 17, 21

Claim 2, 6, 7, 14, 17, 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hodos and Nigg as applied to claim 1 above, and further in view of US Patent No. 5,539,179 to Nozawa et al. ("Nozawa").

Hodos teaches a chuck having a planar outer surface, it being possible for the carrier to be positioned parallel and adjacent to the outer surface of the chuck electrode.

Neither Hodos nor Nigg teaches a chuck electrode.

Nozawa teaches a chuck electrode. (Fig. 1; col. 2, lines 17-29).

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use a chuck electrode as the chuck in Hodos.

The suggestion/motivation would have been to fixedly hold the wafer. (Nozawa, col. 1, lines 9-12).

For claim 6, Nozawa teaches the chuck electrode is constructed on a base body which comprises a radiofrequency electrode, the chuck electrode being electrically insulated from the radiofrequency electrode, with in particular an insulated leadthrough passing through the radiofrequency electrode being provided for contact-connection of the chuck electrode. (Fig. 1; col. 3, lines 17-42).

For claims 7 and 20, Nozawa teaches the chuck electrode comprises a dielectric, in particular a plate of aluminum oxide, which is arranged in such a way that it lies between the chuck electrode and the substrate. (col. 4, lines 33-47). It would have been obvious that that the carrier would be positioned parallel and adjacent to the outer surface of the chuck electrode when the carrier is between the wafer and the chuck electrode, and that the dielectric is arranged between the chuck electrode and the second planar main surface of the carrier.

For claim 14, Nozawa teaches a chuck electrode with a planar outer surface, the extent of which corresponds to at least one main surface of the substrate. (Fig. 1). It would have been obvious that that the carrier would be positioned parallel and adjacent to the outer surface of the chuck electrode when the carrier is between the wafer and the chuck electrode.

Regarding claim 17, Nozawa teaches a chuck electrode is arranged with a planar outer surface parallel and adjacent to a second planar main surface of the substrate. (Fig. 1). ). It would have been obvious that that the second planar main surface of the



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carrier would be positioned parallel and adjacent to the outer surface of the chuck electrode when the carrier is between the wafer and the chuck electrode.

Regarding claim 21, Nozawa teaches applying a voltage. (col. 3, lines 17-42).

C. Claims 2, 8-10, 17 and 22

Claims 2, 8-10, 17 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hodos and Nigg as applied to claim 1 above, and further in view of US Patent No. 6,259,592 to Ono ("Ono").

Hodos teaches a chuck having a planar outer surface, it being possible for the carrier to be positioned parallel and adjacent to the outer surface of the chuck electrode.

Neither Hodos nor Nigg teaches a chuck electrode.

Ono teaches a chuck electrode. (Fig. 2A).

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use a chuck electrode as the chuck in Hodos.

The suggestion/motivation would have been to fixedly hold the wafer. (Ono, col. 1, lines 16-19).

Regarding claim 8, Ono teaches a voltage source (210) for applying a voltage of 1500 V. 6259592 teaches 1500V. (col. 1, line 65 – col. 2, line 6).

For claim 9, Ono teaches the chuck electrode comprises a plurality of regions of different polarity. (col. 5, lines 8-12).

For claim 10, Ono teaches a gas feed for feeding a gas into a space between the chuck electrode and the substrate (Fig. 7; col. 6, lines 21-34).

Regarding claim 17, Ono teaches a chuck electrode arranged with a planar outer surface parallel and adjacent to a second planar main surface of the substrate. (Fig. 2A). It would have been obvious that that the second planar main surface of the carrier would be positioned parallel and adjacent to the outer surface of the chuck electrode when the carrier is between the wafer and the chuck electrode.

Regarding claim 22, Ono teaches controlling the temperature of the substrate by introducing a gas at a superatmospheric pressure into a space between the second main surface of the carrier and the planar outer surface of the chuck electrode. (col. 6, lines 21-34).

D. Claims 3, 4, 5, 12, 13 and 18

Claims 3, 4, 5, 12, 13 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hodos and Nigg and Ono as applied to claim 2 above, and further in view of US Patent No. 5,508,357 to Matsuura et al. ("Matsuura").

For claim 3, Nigg teaches the frame is conductive (para. [0021]).

Matsuura teaches the carrier consists of a nonconductive dielectric material and is provided with a conductive layer on one side. (col. 12, lines 50-63).

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use the films of Matsuura with the frames of Hodos and Nigg.

The suggestion/motivation would have been to utilize the adhesive polyimide/conductor layers and films used as part of the chuck in Ono (col. 5, lines 28-65) as the adhesive film taught in Nigg.

In addition, it is inherent that the conductive layer of the carrier is contact-connected to the conductive region of the frame because the entire frame in Nigg is conductive and the carrier contacts the frame.

For claim 4, Matsuura teaches a vacuum-compatible, thermally stable polyimide film, and the conductive layer is formed by a vapor-deposited metallization. (col. 12, lines 50-63).

For claim 5, Ono teaches a polyimide/conductive dopant film with a thickness of 20-300  $\mu\text{m}$  (col. 5, lines 57-65). The thickness of the metallization would have been obvious because the doping material increases the conductivity of the polyimide (Ono, col. 5, lines 37-56), and hence the amount and thickness of the metallization is a result-effective variable.

For claim 12, Nigg teaches the frame is conductive (para. [0021]) and Matsuura teaches a conductive layer on the polyimide film (col. 12, lines 50-63). It is inherent that the conductive layer of the clamped-in carrier can be contact-connected through the conductive region because the entire frame in Nigg is conductive and the carrier contacts the frame.

For claim 13, Matsuura teaches a film that on one side has a conductive layer formed by a vapor-deposited metallization, the film substantially being produced from polyimide. (col. 12, lines 50-63).

For claim 18, Matsuura teaches the first main surface of the carrier is provided with a conductive layer. (col. 12, lines 50-63).

E. Claim 19

Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hodos, Nigg, Ono and Matsuura, as applied to claim 18 above, and further in view of Nozawa

Nozawa teaches the chuck electrode is built on a base body which is formed by a radiofrequency electrode, the chuck electrode being electrically insulated from the radiofrequency electrode, and the voltage being applied between the chuck electrode and the frame in particular by means of an insulated leadthrough. (Fig. 1; col. 3, lines 17-42).

F. Claim 23

Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hodos, Nigg and Ono, as applied to claim 17 above, and further in view of US Application No. 2002/0078891 to Chu et al. ("Chu").

Neither Hodos, Nigg nor Ono teaches releasing the substrate by short-circuiting with the chuck electrode.

Chu teaches releasing the substrate by short circuiting with the chuck electrode. (para. [0022], [0062]).

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to release the substrate by short-circuiting with the chuck electrode.

The suggestion/motivation would have been to chuck the wafer without damaging it during dechucking. (Chu, para. [0005]).

**Conclusion**


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew Eggerding whose telephone number is (571)

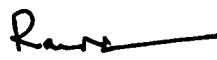
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272-8012. The examiner can normally be reached on Monday-Friday, 8:30 AM-5:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on (571) 272-1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

  
MTE

  
RAM N. KACKAR, P.E.  
PRIMARY EXAMINER